The University of Southern Mississippi
School of Ocean Science and Engineering – Division of Coastal Sciences
COA 690/790 Special topic: GIS in Marine Science (3 credits)

COURSE SYLLABUS

Instructor: Wei Wu
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Class schedule: Tuesday & Thursday 11:30 am - 12:45 pm at Caylor 103 on GCRL Halstead campus

Office Hours: Drop by or by appointment

Prerequisites: Ready to think spatially!

Course description
This course offers an introduction to geographic information systems and their application in coastal and marine science, focusing on spatial data development and analysis in science and resource management. Topics covered include: basic data structures, data sources, data collection, data quality, geodesy and map projections, spatial and tabular data analyses, spatial interpolation, and useful toolkits in coastal and marine science. Laboratory exercises provide practical experiences that complement the theories covered in lecture.

Course Objectives
At the conclusion of the course, students should be able to:
1) Explain the fundamental concepts in the acquisition, processing, organization, and management of spatial data, including data models, relational database management, map coordinate systems etc.
2) Be familiar with the software ArcGIS in performing spatial analysis.
3) Conduct research using spatial data and spatial analysis.

Textbook
A First Text on Geographic Information Systems. Fourth edition. By Paul V. Bolstad, Eider Press 2012. ISBN: 978-0-9717647-3-6.

Course documents
Ecospatial.usm.edu

Student responsibilities
As a student, it is your responsibility to attend the lectures, do the readings, and do assigned lab problems. Please send your completed assignment to

geostats.2018@gmail.com. Email your questions and other issues to wei.wu@usm.edu.

Software
ArcGIS 10.x. Registered students will receive a 1-year license of ArcGIS for use.

Lab assignments
Approximately 12 labs will be given over the semester. Lab problems will be due in one week after assignment. Labs won't be accepted if they are more than 1 week late. You may use late submission only once. You may choose to redo the lab assignments to improve your grade, but keep in mind that the full mark for redo is 90 instead of regular 100.

Evaluation
Lab assignments = 45%
Course project = 30% (8% final presentation)
Quiz = 20%
Class participation = 5%

Course grading
Grading will be on a straight scale, not on a curve. If you do well, you will all get an A.
A   90 – 100   Excellent
A-   88 – 89.9   Very Good
B+   86 – 87.9   Good
B   82 – 85.9   Satisfied
B-   78 – 81.9   Adequate, but needs improvement
C+   70 – 77.9
C   65 – 69.9
C-   60 – 64.9   Minimum passing
F   0 – 59.9

Academic Integrity Statement
All students at the University of Southern Mississippi are expected to demonstrate the highest levels of academic integrity in all that they do. Forms of academic dishonesty include (but are not limited to):
- Cheating (including copying from others' work)
- Plagiarism (representing another person's words or ideas as your own; failure to properly cite the source of your information, argument, or concepts)
- Falsification of documents
- Disclosure of test or other assignment content to another student
- Submission of the same paper or other assignment to more than one class without the explicit approval of all faculty members' involved
- Unauthorized academic collaboration with others
- Conspiracy to engage in academic misconduct

Engaging in any of these behaviors or supporting others who do so will result in academic penalties and/or other sanctions. If a faculty member determines that a student

has violated our Academic Integrity Policy, sanctions ranging from resubmission of work to course failure may occur, including the possibility of receiving a grade of "XF" for the course, which will be on the student's transcript with the notation "Failure due to academic misconduct." For more details, please see the University's Academic Integrity Policy: https://www.usm.edu/institutional-policies/policy-acaf-pro-012 Note that repeated acts of academic misconduct will lead to expulsion from the University.

Disability Statement
If a student believes that they have a disability which is covered by the Americans with Disabilities Act (ADA) and makes them eligible to receive classroom or housing accommodations, they should contact the Office for Disability Accommodations (ODA) for information regarding the registration process. Disabilities covered by the ADA may include but are not limited to ADHD, learning disabilities, psychiatric disabilities, physical disabilities, chronic health disorders, temporary illnesses or injuries and pregnancies. Students should contact ODA if they are not certain whether their documented medical condition qualifies for ODA services. Students are only required to disclose their disability to the Office for Disability Accommodations. All information submitted to ODA by the student is held with strict confidentiality.

Address:
The University of Southern Mississippi
Office for Disability Accommodations
118 College Drive # 8586
Hattiesburg, MS 39406-0001
Voice Telephone: 601.266.5024 or 228.214.3302 Fax: 601.266.6035
Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1.800.582.2233 (TTY) or email ODA at oda@usm.edu.

Tentative Schedule

Week	Topic	Required readings
January 24 & 29	Course introduction, what is GIS, raster and vector data structure, ESRI courses	Chapter 1
January 31 & February 5	Data models	Chapter 2
February 7 & 12	Map projection and coordinates	Chapter 3
February 14 & 19	Maps, data entry and editing **Quiz 1**	Chapter 4
February 21 & 26	Aerial and satellite images	Chapter 6
February 28	Digital Data	Chapter 7

March 5	**Mardi Gras holiday**, class does not meet.	
March 7	Digital data lab	Chapter 7
March 11-15	**Spring break**, class does not meet.	
March 19 & 21	Basic spatial analysis **Course project proposal due**	Chapter 9
March 26 & 28	Raster analysis and modeling	Chapter 10
April 2 & 4	Spatial interpolation	Chapter 12
April 9 & 11	Relational database	Chapter 8
April 16 & 18	**Quiz 2,** Marine Spatial Ecology Tools	http://mgel.env.duke.edu/mget
April 23 & 25	Bathymetric landscape features and gray whale habitat use, Building models for GIS analysis using ArcGIS, Working with NetCDF data in ArcGIS	ESRI online courses
April 30	Final presentation	